

CYPRAEIDAE FROM GUAM

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Guam is the largest and the southernmost of the Marianas Islands. It is situated in 13° 26' North Latitude and 144° 39' East Longitude. The island is composed almost entirely of raised coral formation, and is approximately 30 miles long, with an average width of about 7 miles.

The data used here are based upon specimens collected by H. G. Hornbostel in 1923 and 1925 and by Lieutenant Commander and Mrs. Clark in 1937. The cowries taken by Mr. Hornbostel are now housed in the Bernice P. Bishop Museum in Honolulu, and those gathered by Lieutenant and Mrs. Clark are in the writer's collection.

The two collections include 18 species of cowries from Guam, the majority of which were taken from Tumon Bay on the west shore of the island. A shelving reef in this bay provides an ideal habitat for marine mollusks. Here the surf is but moderately rough, and much of the reef is exposed at low tide.

Apparently the most common species in Guam are *Cypraea moneta* Linnaeus, the common Indo-Pacific species, and *Cypraea lynx* Linnaeus, which is also Indo-Pacific in its distribution. None of the other species listed here are abundant in the two collections.

At least two of the eighteen species were used by the early inhabitants for ornamental or for burial purposes. Perforated individuals of *Cypraea tigris* Linnaeus in the Bishop Museum collection indicate that members of this species were employed for personal adornment. Hornbostel reports that beach-worn shells of *Cypraea caput-serpentis* Linnaeus were found in almost all monument sites where the native dead were buried.¹

My purpose here is to record the members of the *Cypraeidae* from Guam, and to present further information regarding the distribution of this family in the North Pacific.^{2,3}

¹ Thompson, L. M. *Archeology of the Marianas Islands*. Bishop Museum Bull. 100, 1932.

² Ingram, W. M. *The Family Cypraeidae in the Hawaiian Islands*. THE NAUTILUS, Vol. 50, 1937.

³ Ingram, W. M. *Cypraeidae from Christmas, Palmyra, Washington, and Fanning Island*. THE NAUTILUS, Vol. 51, 1937.

Cypraea annulus Linnaeus. The annular ring on the dorsal surface of all shells is very distinct. The 11 specimens in the writer's collection are of nearly uniform length; the largest shell measuring 20 mm. and the smallest 16 mm.

Cypraea arabica Linnaeus. The arabic pattern is clearly defined; the marginal filling is light brown. The largest specimen measures 60 mm. in length.

Cypraea caput-serpentis Linnaeus. The marginal filling in all specimens is dark brown and extends well over the lateral surface of the shell. The dorsal reticulated color pattern is clear; dorsally the anterior and posterior canal regions are marked by a blotch of white or brownish-white.

Cypraea carneola Linnaeus. The largest of the specimens is 50 mm. long. The individuals are all elongate; none approach the so-called variety *propinqua* Garr.

Cypraea erosa Linnaeus. Specimens have a very light dorsal coloration, and the eroded pattern on the outer lip is pronounced.

Cypraea helvola Linnaeus. The specimens have a moderately orange colored marginal filling. Dorsally the anterior and posterior canal extremities are marked with purple. The largest individual is 25 mm. long.

Cypraea intermedia Gray. The reticulated pattern on the dorsal surface of many of the shells is composed of nearly circular breaks in the otherwise light brown pattern. The largest individual is 44 mm. long.

Cypraea isabella Linnaeus. The brown dashes on the dorsal surface of the shell are very light.

Cypraea lynx Linnaeus. The dorsal coloration of the majority of shells is light brown. The writer has two specimens which are a smoky blue-grey in color. The largest individual is 55 mm. long.

Cypraea mappa Linnaeus. There is but one individual in the museum collection; this is the pink base form. Its length is 85 mm.

Cypraea mauritiana Linnaeus. The reticulated pattern is clear, and the dorsal anterior and posterior canal regions are tinged with orange-brown.

Cypraea moneta Linnaeus. This is the most common species in the collections. The individuals vary in color from deep orange

to greyish-white. A few possess an imperfectly formed ring on their dorsal surface.

Cypraea reticulata Martyn. The individuals are small; the largest specimen is 56 mm. long.

Cypraea talpa Linnaeus. The largest individual in the collections is 66 mm. long.

Cypraea testudinaria Linnaeus. One specimen is in the museum collection. Its dorsal surface is light brown blotched with darker shades of this color.

Cypraea tigris Linnaeus. Two adult and one juvenile specimen are in the museum collection. The adults are 80 mm. long. One has a blotched brown dorsal color pattern, and the other a brown spotted pattern.

Cypraea ventriculus Lamarck. The largest individual of those in the collections is 55 mm. in length.

Cypraea vitellus Linnaeus. The marginal fillings of all of the specimens are dark brown. The largest shell is 60 mm. in length.

THE TYPE LOCALITY OF "*HELIX TUDICULATA* VAR. *TULARENSIS* HEMPHILL"

BY G. D. HANNA

On June 16, 1933, I had an opportunity to escape the summer heat of the San Joaquin Valley where some field work was in progress. The high land of the Sierra Nevada in the drainage of the various branches of Tule River was the most convenient place for a brief visit. As I approached Porterville Hemphill's "*tularensis*" came to mind with its vague locality, "Fraser's Mill" about which there has been much speculation. The nature and location of the "Mill" has not been recorded in conchological literature and some of us fear it might fall in the long list of "lost localities." Mr. J. B. Hardaway in Porterville told me I should seek an old settler in Springville, Mr. J. R. Talley. Mr. Talley gave me very complete information which was later verified by direct examination and through the help of Mr. George Dillon, of Mountain Home. This is essentially as follows:

The mill was built by J. B. Fraser about 1878 to convert a fine grove of giant sequoias into lumber. In 1886 it was sold to the